

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

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Applicant's or agent's file reference P27050PC00/AA	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA416)	
International application No. PCT/NL 03/00912	International filing date (day/month/year) 19.12.2003	Priority date (day/month/year) 19.12.2003
International Patent Classification (IPC) or both national classification and IPC H04Q7/30		
Applicant TELEFONAKTIEBOLAGET LM ERICSSON et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 2 sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 21.06.2005	Date of completion of this report 10.11.2005
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Möll, H-P Telephone No. +49 89 2399-8243 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NL 03/00912**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as originally filed

Claims, Numbers

1-8 received on 13.10.2005 with letter of 13.10.2005

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

see separate sheet

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International application No. PCT/NL 03/00912

Cited Documents

1. Reference is made to the following documents:

D1: GB A 2 281 458
D2: WO A 01 82641
D3: EP A 0 287 305
D4: US B 6 584 330

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

A. Clarity and Consistency

1. Claim 1:

- 1.1 Independent **Claim 1** does not meet the requirements of Article 6 PCT and Rule 10.2 PCT regarding **clarity** and **consistency of terminology** respectively for the following reasons:

1.1.1 **Claim 1** uses the inconsistent expressions "power budget" and "budget" (page 13, line 10) for designating the same object.

1.1.2 **Claim 1** uses the inconsistent expressions "power supply units" and "supply units" (page 13, line 11) for designating the same object.

- 1.2 The same terminology should have been consistently used throughout the whole application documents (Article 6 and Rule 10.2 PCT).

B. Novelty / Inventive Step:

1. The present International Application relates to a "telecommunication apparatus" according to independent **Claim 1**. Such a "telecommunication apparatus" can be embodied e.g. as a radio base station.

In the basic scenario of the present application, a plurality of traffic handling units

(e.g. power amplifiers, processing units, ...) are powered by a plurality of power supply units. A power budget is determined based on a power criterion and an amount of said plurality of traffic handling units is activated having a total power consumption equal to or less than the determined power budget.

2. This basic power management scenario is also known from the documents cited in the International Search Report (ISR):
 - 2.1 **D1** shows in this respect a power management system in which based on the detection of a decrease of the power supply units' output voltage, a power distribution unit progressively isolates transceiver units. Document **D1** discloses a plurality of power supply units all connected in parallel similar to the present application.
 - 2.2 **D2-D4** all propose the same concept, namely deactivating equipment and/or functions at a telecommunication apparatus in order to reduce total power consumption.
3. The present application deals with the technical problem that in a power supply system with a plurality of power supply units, even when deactivating traffic handling units to match a determined power budget, the power consumption intrinsic to each individual power supply unit (generated by circuitry needed to operate the power supply unit) well continues. Thus, more power than indeed necessary is consumed.
4. The present application solves the above-mentioned technical problem according to the subject-matter of independent **Claim 1** by the further feature of activating an amount of power supply units of the plurality of power supply units matching the total power consumption of the amount of activated traffic handling units.
5. None of the available prior art documents alone or in combination discloses or suggests this specific implementation as defined in independent **Claim 1**.
 - 5.1 Documents **D2-D4** do not even disclose a scenario having a plurality of individual power supply units. **D1** discloses a plurality of parallel-connected power supply units, but is apparently silent about activating an amount of power supply units

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matching the amount of activated traffic handling units.

5.2 Independent **Claim 1** thus meets the requirements of Article 33(2) and (3) PCT regarding **novelty** and **inventive step**.

6. As a consequence, **Claims 2-8**, as being directly or indirectly dependent on **Claim 1**, also meet the requirements of Article 33(2) and (3) PCT regarding **novelty** and **inventive step**.

C. Further Deficiencies / Defects:

1. Contrary to the requirements of Rule 5.1.(a) (ii) PCT, the relevant background art disclosed in the document **D1** cited above is not mentioned in the description, nor is document **D1** identified therein.

In the introductory part of the description (pages 1/2), the statements indicating the background art and the *technical problem* to be solved should be revised with reference to the relevant prior art document **D1** cited above (Rule 5.1 (a) (iii) PCT). The applicant is referred to the provisions formulated in the PCT International Search and Preliminary Examination Guidelines, Part VI, Chapter 20, items 20.15 and 20.18.

2. The Claims do not include reference signs in parentheses where features shown in the drawings are referred to (Rule 6.2(b) PCT).

1. A telecommunication apparatus comprising: (55)
- a plurality of traffic handling units, and
 - a plurality of power supply unit for powering the plurality of traffic handling units,
- 5 characterised in that the telecommunication apparatus further comprises:
- control means for determining a power budget based on a power criterion, the control means for activating an amount of traffic handling units of the plurality of traffic handling units having a
- 10 total power consumption equal to or less than the budget, and for activating an amount of power supply units of the plurality of supply units matching the total power consumption of the amount of activated traffic handling units.
- 15 2. The telecommunication apparatus according to claim 1, wherein the power criterion comprises one or more of a group comprising an amount of solar cell generated power, a charging condition of a battery for supplying power to the apparatus, a value of a mains voltage supplied to the apparatus, an amount of fuel in a fuel tank of a generator for
- 20 generating power for feeding the apparatus, and a failure of a power supply unit.
3. The telecommunication apparatus according to claim 1 or 2, wherein the power criterion comprises a forecast of one or more of a group
- 25 comprising an amount of solar cell generated power, a charging condition of a battery for supplying power to the apparatus, a value of a mains voltage supplied to the apparatus, an amount of fuel in a fuel tank of a generator for generating power for feeding the apparatus, and a traffic load of the apparatus.
- 30 4. The telecommunication apparatus according to any of the preceding claims, wherein the control means are adapted for transferring active traffic from a traffic handling unit which is to be de-activated, to one or more of the activated traffic handling units, before de-
- 35 activating the to be de-activated traffic handling unit.
5. The telecommunication apparatus according to any of the preceding

claims, wherein a maximum power output of a subgroup of the plurality of power supply units matches a maximum power consumption of a subgroup of the plurality of traffic handling units.

- 5 6. The telecommunication apparatus according to any of the preceding claims, wherein the control means comprise a
- power status monitor for determining the power budget based on the power criterion,
 - a regulator for generating a regulator signal from an amount of
- 10 active traffic,
- and a decider for deciding on an activation of one or more of the plurality of power supply units based on the power budget as determined by the power status monitor, the regulator signal and an actual power consumption.

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7. The telecommunication apparatus according to claim 6, wherein the decider comprises a decision mechanism for taking account of the power budget as a limit value, the regulator signal as a desired value, and the actual used power as a factual value, the decision mechanism
- 20 being adapted for activating as many power supply units and traffic handling units as required to match the regulator signal, the decision mechanism however being adapted to activate not more power supply units and traffic handling units than allowed by the power budget.

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8. The telecommunication apparatus according to any of the preceding claims, wherein the control means comprise a stay alive mechanism for
- when the power budget is under a first, predetermined level, only
- 30 activating power supplies and traffic handling units to process emergency calls,
- when the power budget is under a second, predetermined level which is lower than the first level, not activating any of the traffic handling units and only keeping the control means and further
- 35 monitoring hardware active, and
- when the power budget is under a third, predetermined level which is lower than the second level, shutting down the telecommunication apparatus.